6.0 Design Guidelines

This chapter provides details on the recommended design and operating standards for the San Bernardino County Bikeway System.

The Caltrans Design Manual, Chapter 1000 – Bikeway Planning and Design establishes the standards for bicycle facility design within the state of California. These standards are, for the most part, consistent with the American Association of State Highway and Transportation Officials (AASHTO) Guidelines for the Development of Bicycle Facilities. The Caltrans standards provide the primary basis for the design recommendations that follow.

6.1 Definitions

The following section summarizes key operating and design definitions.

- **Bicycle**: A device, upon which any person may ride, propelled exclusively by human power through a belt, chain, or gears, and having two wheels in a tandem arrangement.

- **Class I Bikeway (Shared Use Path or Bike Path)**: A bikeway physically separated from any street or highway. Shared Use Paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. For an example, see the figure immediately below.

Figure 6.1 – Class I Bikeway Information

Class II Bikeway (Bike Lane): A portion of roadway that has been designated by striping, signaling, and pavement markings for the preferential or exclusive use of bicyclists. For an example, see the graphics immediately below.

Figure 6.2 – Class II Bikeway Information

Class III Bikeway (Bike Route): A generic term for any road, street, path, or way that in some manner is specifically designated for bicycle travel regardless of whether such facilities are designated for the exclusive use of bicycles, or are to be shared with other transportation modes. For an example, see the graphics immediately below.

Figure 6.3 – Class III Bikeway Information

Signed Shared Roadway or Signed Bike Route: A shared roadway that has been designated by signing as a preferred route for bicycle use. These are Class III facilities under the Caltrans Design Standards.

6.2 Bicycle Design Recommendations

The following guidelines present the recommended minimum design standards and other recommended ancillary support items for shared use paths, bike lanes, and signed shared roadways. All bikeways should meet minimum Caltrans/AASHTO standards and/or the Manual on Uniform Traffic Control Devices (MUTCD). Where possible, it may be desirable to exceed the minimum standards for bike paths or bike lane widths, signage, lighting, and traffic signal

detectors. In cases where Caltrans and AASHTO guidelines conflict, Caltrans Design Standards will take precedence.

6.2.1 Class I Bike Path Facilities

1. All shared use paths should generally conform to the design recommendation by Caltrans/AASHTO/MUTCD.

2. Class I bike paths should generally by designed as separated facilities away from parallel streets. They are commonly planned along rights-of-way such as waterways, utility corridors, flood control access roads, railroads, and the like that offer continuous separated riding opportunities. Special signage to separate different uses may be installed as per MUTCD guidelines seen in the figure below.

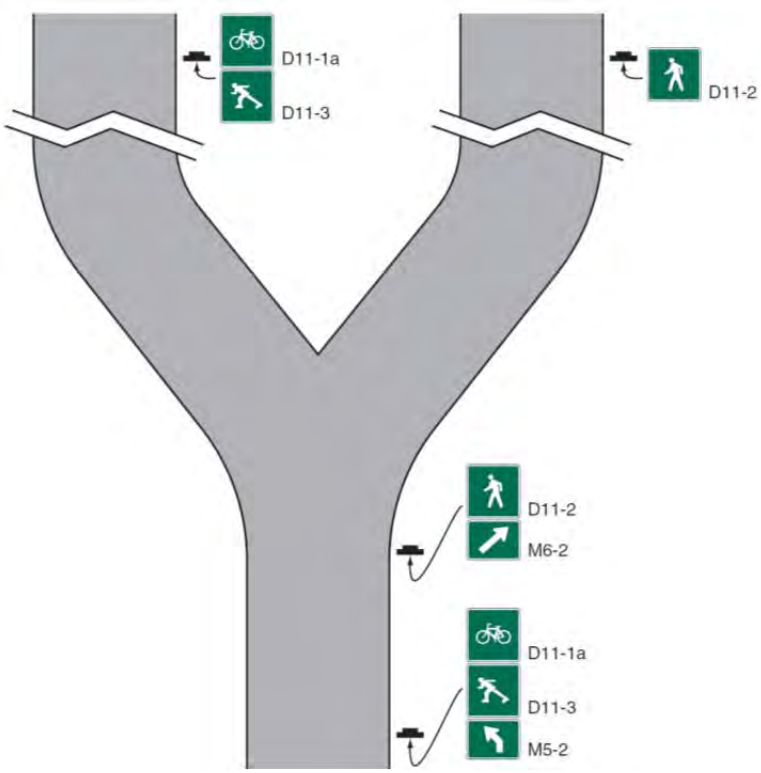


Figure 6.4 – Mode-specific Guide Signs for Shared-use Paths

3. Bike paths should have a minimum of eight feet of pavement, with at least two feet of unpaved shoulders for pedestrians/runners, or a separate tread way where feasible. Paved width of twelve feet is preferred. Direct pedestrians to right side of pathway with signing and/or stenciling.

4. Multi-use trails and unpaved facilities that serve primarily a recreation rather than a transportation function and will not be funded with federal or state transportation dollars

may not need to be designed to Caltrans/AASHTO/MUTCD standards.

5. Both AASHTO and Caltrans recommend against using most sidewalks for bike paths. This is due to conflicts with driveways and intersections. Where sidewalks are used as bike paths, they should be placed in locations with few driveways and intersections, should be properly separated from the roadway, and should have carefully designed intersection crossings.

6. Shared use path crossings of roadways require preliminary review. A prototype design is presented in the abovementioned Definitions section.

7. Crossings of roadways, other than at intersections, should be carefully engineered to accommodate a safe and visible crossing for users. The design needs to consider the width of the roadway, whether it has a median, and the roadway's average daily and peak-hour traffic volumes. Crossings of low-volume streets may require simple stop signs. Generally speaking, bike paths that cross roadways with Average Daily Trips (ADTs) over 15,000 vehicles will require signalization, grade separation, flashing LED beacons, crossing islands, other devices, or a combination of such features. Roundabouts can provide desirable treatment for a bike path intersecting with roadways where the bike path is not next to a parallel street.

Figure 6.5 – Combined Bike/Pedestrian Crossing Sign

8. Landscaping should generally consist of low water-consuming native vegetation and should have the least amount of debris.

9. Lighting should be provided where commuters will likely use the bike path in the evenings.

10. Barriers at pathway entrances should be clearly marked with reflectors and be ADA accessible (minimum five feet clearance).

11. Bike path construction should take into account vertical requirements, the impacts of maintenance, and emergency vehicles on shoulders.

12. Provide adequate trailhead parking and other facilities such as restrooms, and drinking fountains at appropriate locations.

6.2.2 Class II Bike Lane Facilities

The following guidelines should be used when designing Class II bikeway facilities. These guidelines are provided by the Caltrans Highway Design Manual, Chapter 1000, AASHTO, MUTCD, and the Caltrans Traffic Manual.

1. Class II Bike Lane facilities should conform to the minimum design standard of five feet in width in the direction of vehicle travel adjacent to the curb lane. Where space is available, a width of 6 to 8 feet is preferred, especially on busy arterial streets, on grades, and adjacent to parallel parking.

2. Under certain circumstances, bike lanes may be four feet in width. Situations where this is permitted include the following.

    - Bike lanes located between through traffic lanes and right turn pockets at intersection approaches. See Figure 5.8.

    - Where there is no parking, the gutter pan is no more than 12” wide, and the pavement is smooth and flush with the gutter pan.

    - Where there is no curb and the pavement is smooth to the curb.

3. “Bike Lane” signage, as shown directly below, shall be posted after every significant intersection along the route of the bike lane facility. Directional signage may also accompany this sign to guide bicyclists along the route. If a bike lane exists where parking is prohibited, “no parking” signage may accompany bike lane signage.

Figure 6.6 – Bike Lane Sign

4. Bike lanes should be striped with a solid white stripe of width at least 4 inches and may be dashed up to 200 feet before the approach to an intersection. This design of a dashed bike lane allows for its dual use as a right-turn pocket for motor vehicles.

5. Stencils shall also be used within the lane on the pavement that read “bike lane” and include a stencil of a bicycle with an arrow showing the direction of travel. See the figure below.

Figure 6.7 – Bike Lane Markings

6. Bike lanes with two stripes are more visible than those with one and are preferred. The second stripe would differentiate the bike lane from the parking lane where appropriate.

7. Where space permits, intersection treatments should include bike lane 'pockets' as shown in the figure below.

Figure 6.8 – Bike Lane Pocket

8. Loop detectors that detect bicycles should be installed near the stop bar in the bike lane at all signalized arterial/arterial, arterial/collector, and collector/collector intersections where bicycles are not reasonably accommodated. The location of the detectors should

be identified by a stencil of a bicycle and the words “Bicycle Detector”. Signal timing and phasing should be set to accommodate bicycle acceleration speeds. Please see the figure below.

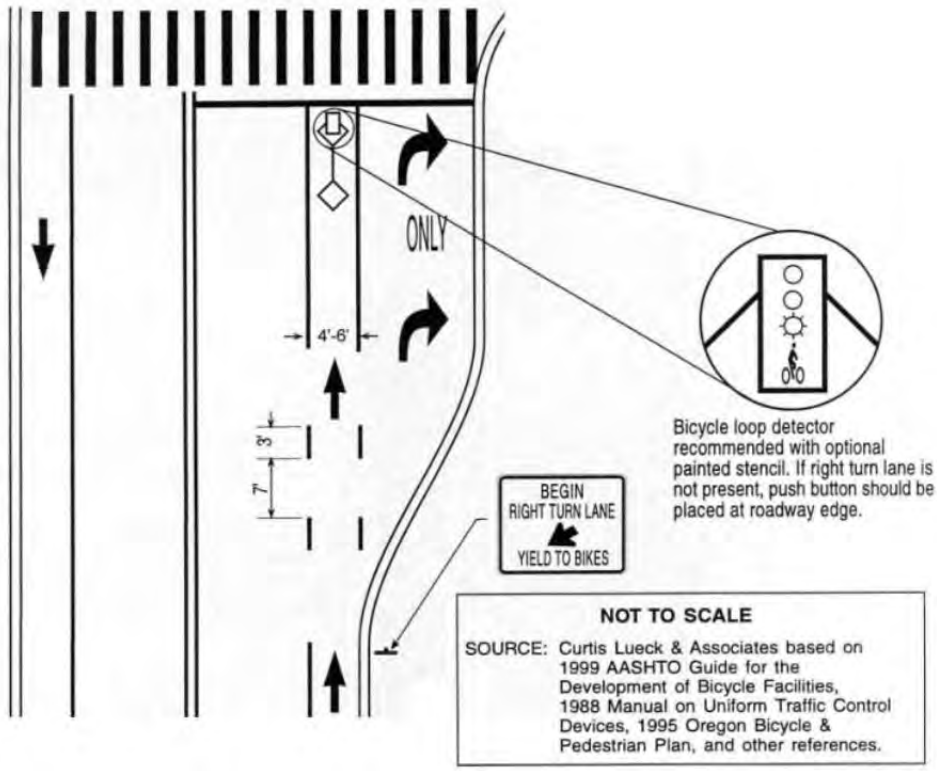


Figure 6.9 – Bike Lane Treatments at Intersection

9. Bicycle-sensitive loop detectors are preferred over a signalized button specifically designed for bicyclists.

10. Bike lane pockets between right turn lanes and through lanes should be provided wherever available width allows and where right turn volumes exceed 150 motor vehicles per hour.

11. Where bottlenecks preclude continuous bike lanes, they should be linked with bikeway route treatments.

6.2.3 Class III Bike Route Facilities

Bike routes have been typically designated as simple signed routes along street corridors, usually local streets and collectors, and sometimes along arterials. With proper route signage, design, and maintenance, bike routes can be effective in guiding bicyclists along a route suited for bicycling without having enough roadway space to provide a dedicated Class II bike lane.

Class III Bike Routes can be designed in a manner that encourages bicycle usage, convenience, and safety. There are a variety of other improvements that can enhance the safety

and attraction of streets for bicyclists. Bike routes can become more useful when coupled with such techniques as the following:

- Route, directional, and distance signage
- Wide curb lanes
- Sharrow stencils painted in the traffic lane along the appropriate path of where a bicyclist would ride in the lane
- Accelerated pavement maintenance schedules
- Traffic signals timed and coordinated for cyclists (where appropriate)
- Traffic calming measures

The following design guidelines should be used with the implementation of new Class III Bike Route facilities in the SANBAG region.

Signage

Proper “Bike Route” signage, as shown in the figure below, should be posted after every intersection along the route of the bikeway. This will inform bicyclists that the bikeway facility continues and will alert motorists to the presence of bicyclists along the route. Directional signage may accompany this sign as well to guide bicyclists along the route.

Figure 6.10 – Bike Route Sign

The sharrow stencil is a way to enhance the visibility and safety of new Class III Bike Route facilities. The stencil should be placed outside of on-street vehicle parking to encourage cyclists to ride away from parked cars’ open doors. They should also be placed at one or two locations on every block. See below.

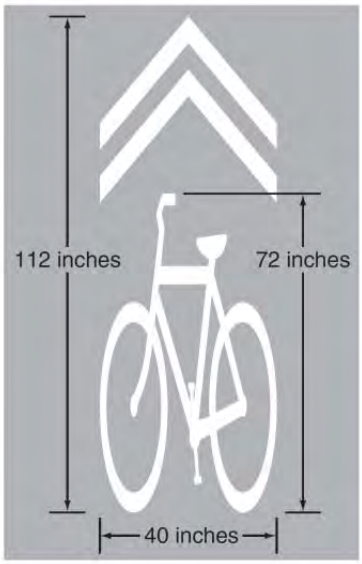


Figure 6.11 – Sharrow Stencil Guidelines

In the case where a lane is too narrow for motorists and cyclists to operate side-by-side, the following sign can be used.

Figure 6.12 – Full Lane Shared Use Sign

Bicycle Boulevards

Bicycle boulevards are Class III bikeways that prioritize bicycles through the use of diverters and other traffic controls. Bicycle boulevards are to be implemented on local streets, generally with fewer than 3,000 vehicles per day, through a combination of traffic calming, intersection treatments, and signing. Bicycle lanes (Class II) are normally not used on a bicycle boulevard, thus little or no parking removal is proposed. The implementation of bicycle boulevards should not result in significant traffic diversion onto other local streets.

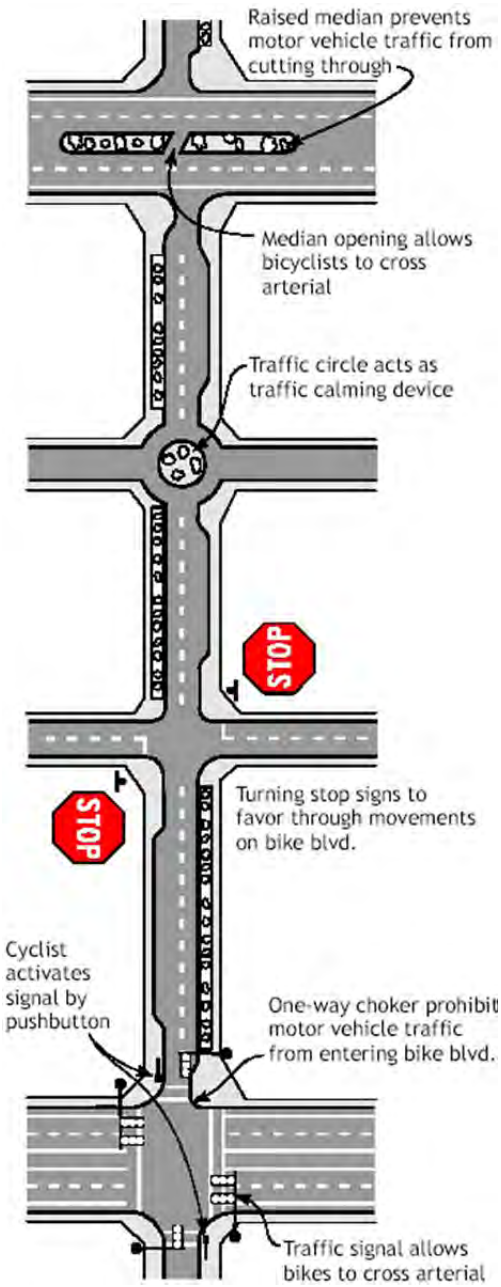


Figure 6.13 – Bike Boulevard Specifications

Bicycle boulevards are most effective when a grid system is in place so motor vehicles can use a parallel route and cyclists can follow a bike boulevard to within a block or two of their destination. Special bicycle stencils, signs, and road treatments are used on bicycle boulevards, as seen in the figure above. Stop signs are often turned on these roadways to prevent cyclists from having to stop at each intersection, and signals are installed at busy intersections to allow safe cyclist crossings.

6.2.4 Numbering Bikeways

A numbered bike route network may be devised as a convenient way for bicyclists to navigate through the valley much the way the numbered highway system guides motorists efficiently through the roadway network. This could be used on all classes of bikeways. An example of a numbered bikeway sign is shown in figure below.

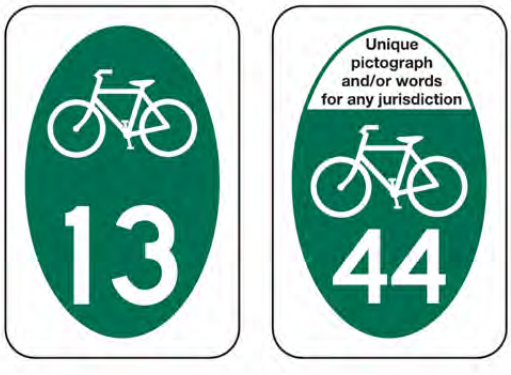


Figure 6.14 – Numbered Bikeway Signs

Destination signs add value to bike routes and assist cyclists to develop a mental map of the route system. Arrows pointing to “Downtown,” “Mojave Narrows Regional Park - 2.5 miles” or “CSU – San Bernardino” should be a standard part of the bikeway network. Destination signs should be placed at the intersection of bikeways to notify cyclists where each bike route goes.

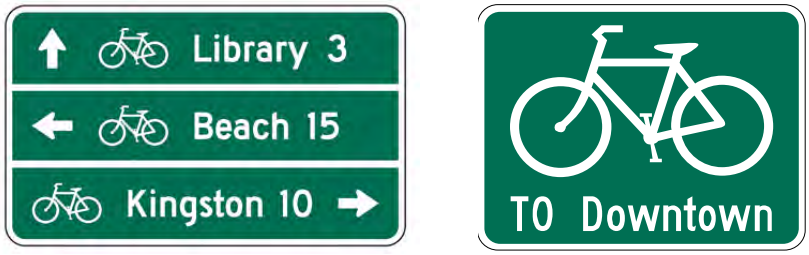


Figure 6.15 – Bicycle Destination Signs

6.2.5 Rumble Strips

Rumble strips are provided to alert motorists that they are wandering off the travel lanes onto the shoulder. They are most common on long sections of straight freeways in rural settings, but are also used on sections of two- lane undivided highways. Early designs placed bumps across the entire width of the shoulder, which is very uncomfortable for cyclists.

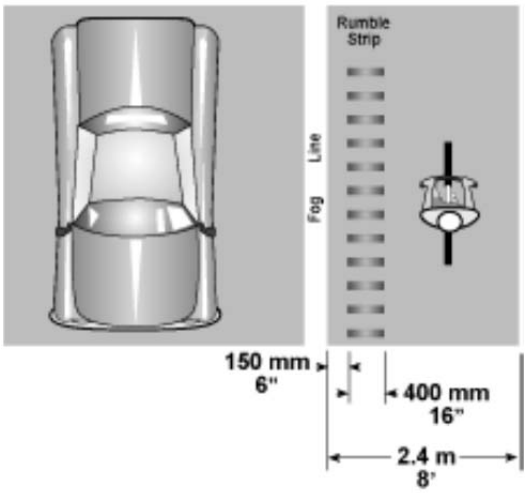


Figure 6.16 – Rumble Strip

A newer rumble strip design is more bicycle-friendly: 400 mm (16") grooves are cut into the shoulder, 150 mm (6") from the fog line. On a 2.4 m (8 ft) shoulder, this leaves 1.8 m (6 ft) of usable shoulder for bicyclists.

6.2.6 Drainage Gates

Care must be taken to ensure that drainage grates are bicycle-safe. If not, a bicycle wheel may fall into the slots of the grate causing the cyclist to fall. Replacing existing grates or welding thin metal straps across the grate perpendicular to the direction of is required. These should be checked periodically to ensure that the straps remain in place.

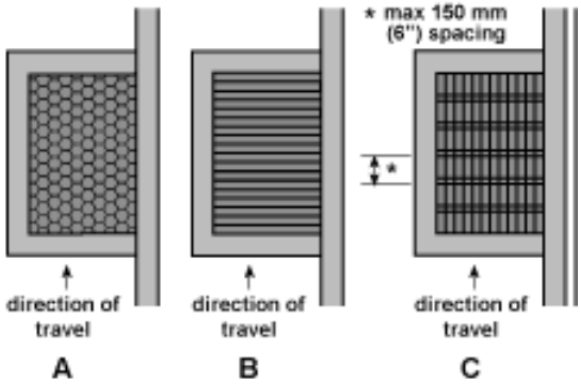


Figure 6.17 – Bike Safe Grates

The most effective way to avoid drainage-grate problems is to eliminate them entirely with the use of inlets in the curb face (type CG-3).

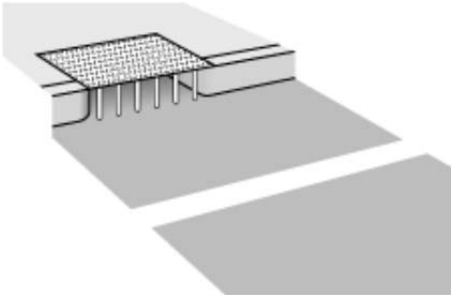


Figure 6.18 – Inlet Flush in the Curb Face

If a street-surface grate is required for drainage (types G-1, G-2, CG-1 and CG-2), care must be taken to ensure that the grate is flush with the road surface.

Inlets should be raised after a pavement overlay to within 6 mm (1/4") of the new surface. If this is not possible or practical, the pavement must taper into drainage inlets so they do not cause an abrupt edge at the inlet.

6.2.7 Extruded Curbs

These create an undesirable condition when used to separate motor vehicles from cyclists: either one may hit the curb and lose control, with the motor vehicle crossing onto the bikeway or the cyclist falling onto the roadway. At night, the curbs cast shadows on the lane, reducing the bicyclist's visibility of the surface. Extruded curbs make bikeways difficult to maintain and tend to collect debris. They are often hit by motor vehicles, causing them to break up and scatter loose pieces onto the surface.

6.2.8 Reflectors & Raised Pavement Markers

These can deflect a bicycle wheel, causing the cyclist to lose control. If pavement markers are needed for motorists, they should be installed on the motorist's side of the stripe, and have a beveled front edge. The use of raised pavement markers has been restricted or prohibited by several jurisdictions in recent years, including Washington State. Provisions can be made for their use in certain circumstances, including lane tapers, on uphill edgelines with 50’ separation between installations, and where a specific engineering study concludes that the benefit of the installation to correct a demonstrable problem at a given site.

6.2.9 Sidewalks as Bicycle Facilities

The use of sidewalks as bicycle facilities is not encouraged by AASHTO, even as a Class III bike route, and may be completely illegal in some jurisdictions across the country. There are exceptions to this rule: while in residential areas, it is true that sidewalk riding by young children too inexperienced to ride in the street is common. With lower bicycle speeds and lower auto speeds, potential conflicts are somewhat lessened, but still exist. But it is inappropriate to sign these facilities as bikeways. Bicyclists should not be encouraged (through signing) to ride facilities that are not designed to accommodate bicycle travel.

Sidewalks can be used for short distances to make connections between off-street shared use paths and other facilities when such routing provides safer and more direct access than other available options.

6.2.10 Roadway Shoulder Evaluation

In areas where roadways have or will be developed with full curb and gutter, the provision of bikeways most often takes the form of striped bike lanes or signed bike routes. On roadways without curb and gutter, which is most often either a county or state road or highway in a rural, unincorporated, or developing area, shoulders provide both a place for bicyclists but also often for pedestrians and a breakdown lane for motor vehicles.

Many roads in the County, especially older roads and those carrying moderate to low traffic volumes, have little or no shoulders. Modern highways and newer roads are typically constructed with shoulders meeting current standards. It is the roadways with no or limited shoulders that present a challenge to local jurisdictions. The major obstacle to retrofitting these roads with adequate shoulders is cost, which in turn is related to:

1. the high number of road miles in the County,
2. the presence of adjacent drainage ditches, utility poles, and other obstacles making construction expensive,
3. lack of right of way, in some cases, and
4. the need to reconstruct roadways to give the shoulder structural integrity.

6.2.11 Shoulder Width

The width of a new or retrofitted shoulder is, in some cases, different for motor vehicle safety than for bicycle safety. For example, while a 3 meter wide (9.8 feet) shoulder is often preferable for vehicle safety, 1.2 meter (4 feet) wide shoulders are often sufficient for bicycle use. According to AASHTO, the most important features to provide for bicyclists on roadways are:

- Paved shoulders
- Wide outside traffic lane (4.2m minimum) if no shoulder
- Bicycle-safe drainage grates
- Adjusting manhole covers to the grade
- Maintaining a smooth, clean riding surface

The widened shoulder will generally be more accommodating in rural circumstances. Where it is intended that bicyclists ride on shoulders, smooth paved shoulders should be provided and maintained. Shoulder width should be a minimum of four (4) feet wide (1.2 meters) when intended to accommodate bicycle travel. Adding or improving shoulders can often be the best way to accommodate bicyclists in rural areas, and they also benefit motor vehicle traffic.

Shoulders constructed for motor vehicle purposes obviously will also benefit bicyclists. This section addresses the provision of shoulders to benefit bicyclists, which means that they (a) may or may not be constructed as part of a roadway paving or repaving project, (b) should be on those segments of the State Bicycle System offering the greatest benefit to bicyclists, and (c) will also benefit motorists and therefore not necessarily funded strictly with bicycle funds. In other words, shoulders will always benefit bicyclists and motor vehicles, and should be considered joint projects. Bicycle funds should be used on shoulders where they provide the greatest benefits to bicyclists.

Several other issues are important to address in relationship to shoulder improvements. First, while shoulders can frequently be widened, narrow bridges represent a potentially worse hazard because there is no escape zone for bicyclists or vehicles. Second, while shoulders always benefit bicyclists, they are especially critical in areas where there is limited motorist visibility, such as around sharp curves, where a vehicle will be surprised to find a bicycle in the roadway. Third, shoulders are always the repository of gravel and debris swept naturally by vehicle traffic, and need to be maintained on a routine basis to be usable by bicyclists. Fourth, in some cases shoulders can be 'created' simply by re-striping the existing pavement, narrowing travel lanes, or shifting lane striping. Finally, in some special circumstances, parallel pathways may supplement (but not replace) shoulders for bicycle traffic.

Wherever possible, new roadway shoulders should be constructed to AASHTO standards. AASHTO identifies a shoulder width of 3 meters (9.8 feet) for roadways with higher traffic volumes. "In difficult terrain and on low-volume highways, (…) the minimum shoulder width of .6 meters (about 2 feet) should be considered and a 1.8 to 2.4 meter width (5.9 feet to 7.8 feet) would be preferable." (p. 338). However, the cost to retrofit many of the state highways in California (and San Bernardino County), especially given the rugged topography and high number of road miles, means that narrower shoulders are a more practical solution. In areas of rugged topography or other constraints, wide shoulders are simply not practical except where there are appreciable traffic volumes. The final decision on shoulder width rests with the reasonable judgment of a licensed engineer.

Any additional shoulder width, even if it is .6 meter (about 2 feet), will benefit bicyclists. In some very constrained areas, or where motor vehicle and bicycle traffic is expected to be low, minimal shoulders between .6 and 1.2 meters (2 and 4 feet) in width are preferable to no shoulders.

Categories of Improvements

While there are a wide variety of roadway settings that have a major impact on cost and feasibility of shoulders, there are four basic categories that describe the range of shoulder improvements (see Figures 5.1, 5.2, and 5.3). It is assumed that all new roadways or roadways with curb and gutter in developed areas will be developed as bike lanes or signed bike routes.

Type 1: New 1.2 meter (4 feet) wide shoulders
Constructed in relatively level terrain, no right of way needed, minor ditch relocation, and minor utility pole relocation. Includes new sub-base, new striping, pavement, striping, and signing.

Cost: $150,000/mile

Type 2: New 1.2 meter (4 feet) wide shoulders
Constructed in moderate terrain, some moderate cuts and fills, some drainage ditch and utility relocation, new striping, and no right of way required.

Cost: $350,000/mile

Type 3: New 0.6 to 1.2 meter (2 to 4 feet) wide shoulders

Constructed in rugged terrain, extensive grading, some new retaining wall, new striping, guardrails, no right of way required, and moderate utility and drainage ditch relocation or improvements.

Cost: $700,000/mile

Type 4: Road Reconstruction to 9.6 meters (32 feet) with minimum 1.2 meter (4 feet) wide shoulders
Where a roadway warrants improvements based on traffic volumes or is being re-constructed due to structural deficiencies, the entire roadway will be constructed rather than simply adding shoulders of any width. While this is a costly approach and would probably be funded as part of a larger roadway project, it avoids long term problems with settling between the roadway and shoulder that can pose a hazard to bicyclists. Cost estimate assumes level to moderate terrain, with no right of way required but some utility and drainage ditch relocation.

Cost: $500,000/mile

Cost

Cost is the single limiting factor to constructing roadway shoulders. Cost in turn is directly related to the adjacent terrain, utilities, drainage ditches, and other constraints. While it is possible to develop an “average” shoulder cost for the local jurisdictions, the actual cost can be broken down into four basic categories for more accurate cost estimating. The estimated cost by category is listed identified above.

To develop an average cost for shoulder improvements, some assumptions must be made about the breakdown between the categories listed above. For planning purposes, this is assumed to be:

- Type 1: 50%
- Type 2: 20%
- Type 3: 20%
- Type 4: 10%

Given these assumptions, the average shoulder improvement cost per mile is estimated to be $335,000.

Individual cost components are shown in Table 2. As can be seen, cost items such as bridges, earth excavation, and drainage can greatly impact the cost of a specific project.

6.2.12 Traffic Calming Programs

Traffic calming includes any effort to moderate or reduce vehicle speeds and/or traffic volumes on streets where that traffic has a negative impact on bicycle or pedestrian movement. Because these efforts may impact traffic outside the immediate corridor, study of traffic impacts is typically required. For example, the City of Berkeley, CA instituted traffic calming techniques by blocking access into residential streets. The impact was less traffic on local streets, and more traffic on arterials and collectors. Other techniques include installing traffic circles, intersection

islands, partial street closings, 'bulb-out' curbs, pavement treatments, lower speed, signal timing, and narrowing travel lanes.

Many cities in California already have a relatively continuous street grid system with little filtering of through traffic into residential neighborhoods. Traffic circles, roundabouts, and other measures may be considered for residential collector streets where there is a desire to control travel speeds and traffic volumes but not to install numerous stop signs or traffic signals.

Traffic calming alternatives should be considered where traffic speeds are exceedingly high, and when safety is an issue.

6.3 Emerging Innovations

Within the past decade, many jurisdictions across the nation are experimenting with and are considering specially designed roadway treatments and traffic signals, new methods of bicycle parking, and other innovations to encourage bicycling and make it safer. This section describes these innovations, including those in use in California as well as those from other parts of the country and world that could have promising applications in San Bernardino County.

6.3.1 Bicycle Boxes

The bike box is an intersection improvement design to prevent bicycle/car collisions, especially between drivers turning right and bicyclists going straight. It is a striped or colored box on the end of the road with a white bicycle symbol inside and includes bicycle lanes approaching the box. Cyclists stop in the bike box to be more visible while they wait for the signal. This waiting area – in front of motor vehicles, but behind the crosswalk – is typically painted a contrasting color. In order to provide maximum safety to bicycles, cars at these intersections are prohibited from making right-hand turns on red.

Figure 6.19 – Bicycle Box

Bicycle boxes increase safety by preventing a common collision at intersections known as the "right hook" where a vehicle making a right turn hits a cyclist proceeding straight through the intersection. Bike boxes are widely used in Europe and a few American cities have started to install them, including Portland, OR, San Luis Obispo, CA, and Long Beach, CA.

6.3.2 Contra-flow Bicycle Lanes

Contra-flow bicycle lanes allow bicyclists to travel in the opposite direction as motor vehicle traffic on one-way streets, thereby providing cyclists with a direct route and avoiding the need to traverse additional blocks to reach their destination. These lanes are clearly separated from opposing lanes with double yellow lines and, depending on conditions, sometimes have partial separation at intersections or mid-block, or complete separation. Factors to be considered during design include vehicle and bicycle turning movements, vehicle and bicycle ADT, available street width, existence of on-street parking and rate of turnover, and transit routes.

6.3.3 Colored Pavement

Colored pavement is used to increase the visibility of bikeways or, more commonly, zones with a high potential for motor vehicle/bicycle conflicts, by indicating cyclist right-of-way with a distinctive color. This convention is designed to remind motorists that they are crossing or adjacent to an area where they can expect to see cyclists and to take extra caution. Colored pavement can be used for very short sections of pavement (such as where a trail crosses an intersection) or for the full length of a bike lane.

Figure 6.20 – Colored Bike Lane in Sunnyvale, CA

On the down side, colored pavement can create a false sense of security for cyclists; confuse motorists since the technique is new and unfamiliar; and have high initial and maintenance costs. Options for creating colored pavement have varying degrees of permanence. Agencies interested in experimenting with colored pavement on a temporary basis can use regular paint or tennis court paint (for green lanes). These paints fade quickly and must be reapplied to

maintain an impact. A more permanent option is to embed color in the last lift of an asphalt overlay, although reapplication requires a grind-out and re-paving.

Portland, OR is the primary U.S. city using colored bike lanes; however, Sunnyvale, CA is experimenting with blue bike pavement and Petaluma, CA is trying out red bike pavement. The city of San Francisco has requested permission to experiment with colored bicycle lanes from the California Traffic Control Devices Committee, the first step toward establishing guidelines for the use of colored lanes.

6.3.4 Traffic Signal Detection

Bicycle detection at signalized intersections can provide a substantial safety improvement for cyclists and motorists alike. This is particularly true in rural areas where there are few signalized intersections but signals are found at crossings of state highways and other major roads. Loop detectors at signalized intersections are used to allow motorists to trigger a traffic light. The following recommendations are intended to expand typical detection loop efforts to include bicycles along designated routes and at key intersections by providing needed improvements such as calibration of existing detectors, installation of new detectors, and installation of stencils. In addition, these recommendations should be incorporated into new development requirements wherever signalized intersections are proposed.

Figure 6.21 – Pushbutton Sign for Signals

General Recommendations

While detector loops facilitate faster and more convenient motorist trips, if they aren't calibrated properly or stop functioning, they can frustrate cyclists waiting for signals to change, unaware that the loop is not detecting their bicycle. Where appropriate, the County should ensure that all existing loops are tested annually and are calibrated and operable for bicycle users.

The County should develop a policy of installing bicycle-calibrated loop detectors at intersections along designated bike routes as they are repaved. For new installation it is recommended that the County use Type D for lead loops in all regular travel lanes shared with bicycles. Within bike lanes it is recommended that the County install Bicycle Loop Detectors (BLDs) using narrow Type C loops. Types A (6' square) and E (unmodified circle) are not bike-sensitive in their center.

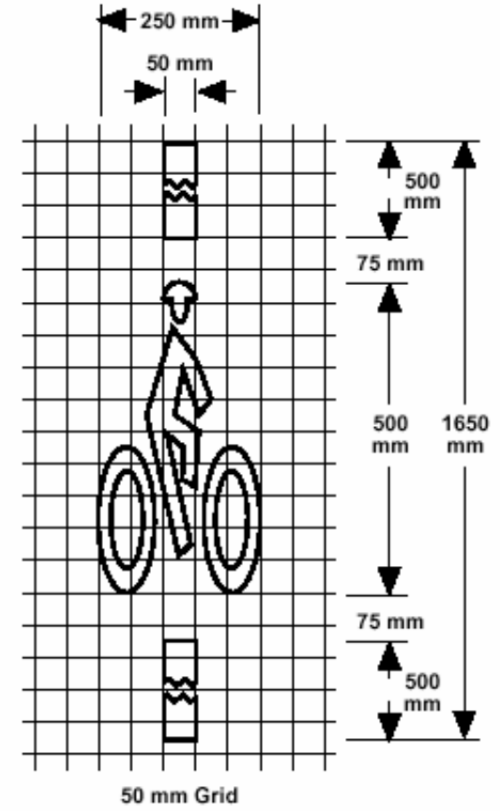


Figure 6.22 – Bicycle Detection Marking

Since most cyclists, as well as motorists, do not know how loop detectors work, all detector loops expected to be used by cyclists should be marked by a pavement stencil that shows cyclists where to stop to activate the loop. Educational materials distributed by the County should describe how to activate bicycle loop detectors. Stencils should be repainted when needed.

Video Detection

Like in-pavement loop detectors, which have been in use throughout many jurisdictions for decades, video detection allows bicyclists to trigger traffic signals at intersections. The technology uses “detection zones” for motorists and cyclists (Figure 6.23) and is most often used at signalized intersections with dedicated bicycle lanes and that are already equipped with motor vehicle video detection.

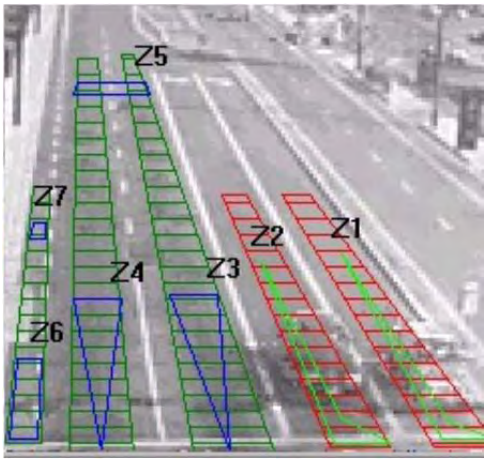


Figure 6.23 – Video Detection System

Video detection is superior to loops because it can detect any bicycle, regardless of frame material, and is not disrupted by asphalt work or other maintenance. However, if a bicyclist does not stop in the detection zone, the camera can miss him or her, thereby leaving the signal phase on red in the cyclist's direction of travel. Furthermore, this technology is compromised by weather conditions, such as heavy fog and bright sunlight. Video detection is currently in use in Santa Rosa, CA.

Assembly Bill 1581, signed into law by then Governor Schwarzenegger in January 2008, adds a section to the California Vehicle code requiring new traffic signals to detect bicycles and motorcycles. The bill applies only to new traffic actuated signals or replacement of loop detectors at a traffic actuated signal. However, Caltrans is charged with developing new signal detection method guidelines before the law takes effect on local jurisdictions.

6.3.5 Bicycle Signals

Bicycle signals are traffic signals equipped with signal heads that apply exclusively to cyclists. Rather than showing simple red, yellow or green lights, these specially designed signals show red, yellow or green bicycle icons, and can be used in conjunction with a pedestrian phase. Since the California Vehicle Code requires bicyclists, like autos, to obey traffic signals, local municipal codes must be changed to allow bicycles to obey bicycle signals instead.

6.4 Bicycle Parking and Facilities

Bicycle parking is not standardized in any state or municipal code. However, there are preferable types of secure bicycle accommodations available. Bicycle parking is a critical component of the network and facilitates bicycle travel, especially for commuting and utilitarian purposes. The provision of bicycle parking at every destination ensures that bicyclists have a place to safely secure their mode of travel. Elements of proper bicycle parking accommodation are outlined below.

6.4.1 Parking Classifications

Bicycle parking facilities in California are classified as follows.

- **Class I**: Class I parking is high security parking, usually with weather protection. This type of parking accommodates employees, residents, and commuters. Class I parking is considered long-term parking and is generally for those who expect to park more than two hours. Examples of Class I parking are storage lockers or restricted access covered areas that provide facilities for individually locked bicycles.

  Bike lockers are covered storage units that typically accommodate one or two bicycles per locker, and provide additional security and protection from the elements. These are typically located at large employment centers, colleges, and transit stations.

  Bike corrals can be found at schools, stadiums, special events, and other locations, and typically involve a movable fencing system that can safely store numerous bicycles. Either locking the enclosure or locating it near other activities so that it can be supervised provides security.

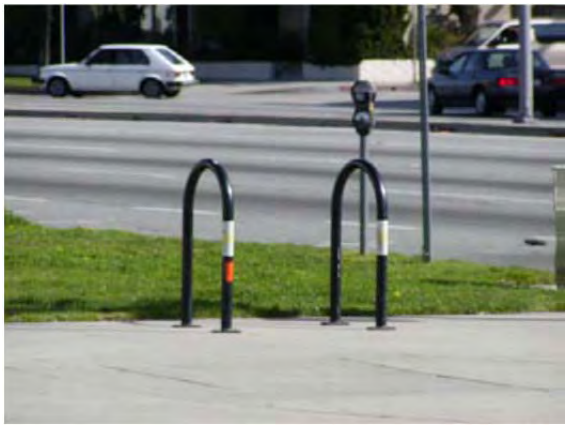
- **Class II**: Class II bicycle parking facilities are best used to accommodate visitors, customers, messengers and others expected to depart within two hours. Class II includes racks that provide two points of contact to allow both wheels and frame to be secured with a user-supplied lock. Bicycle racks provide support for the bicycle but do not have locking mechanisms. They are usually located at schools, commercial locations, and activity centers such as parks, libraries, retail locations, and civic centers.

- **Class III**: Class III bicycle parking is the least secure. It provides only for securing one wheel and frame. This parking class can include street poles or wave bicycle racks.

6.4.2 Effective Guidelines

Bicycle parking facilities should be designed with the following principles in mind to promote a safe, easy, and accessible experience for the commuter or recreational user.

1. Bike racks provide short-term parking. Bicycle racks should offer adequate support for the bicycles and should be easy to lock to. Figures 6.24 and 6.25 display a common inverted-U design that does this. Figure 6.26 depicts a multi-bicycle rack that works well. Figure 6.27 shows an innovative concept in which the bike rack itself looks like a bicycle.



Figures 6.24, 25 – "Inverted U" Bike Racks

Figure 6.26 – Multi-Bicycle Rack

Figure 6.27 – Bike Rack

2. Long-term parking should be provided for those needing all day storage or enhanced security. Bicycle lockers offer good long-term storage, as shown in Figure 6.28. Attendant and automated parking also serves long-term uses, which are discussed in greater detail in the next section.

Figure 6.28 – Bike Lockers

3. Bicycle parking should be clearly identified by signage, such as in the figure below. Signage should also identify the location of racks and lockers at the entrance to shopping centers, buildings, and other establishments where parking may not be provided in an obvious location, such as near a front door. Parking structures or garages for automobiles that have bicycle racks inside should have a bicycle parking sign on the exterior.

Figure 6.29 – Bicycle Parking Sign

4. Bicycle parking should be located close to the front door of buildings and retail establishments in order to provide for the convenience, visibility, and safety of those who park their bicycles.

5. Bicycle lockers should have informational signage, placards, or stickers placed on or immediately adjacent to them identifying the procedure for how to use a locker. This information at a minimum should include the following:

    - Contact information to obtain a locker at City Hall or other administrating establishment
    - Cost (if any) for locker use
    - Terms of use
    - Emergency contact information

6. Bicycle lockers should be labeled explicitly as such and shall not be used for other types of storage.

7. Bicycle racks and storage lockers should be bolted tightly to the ground in a manner that prevents their tampering.

6.4.3 Innovations in Bicycle Parking and Trip Facilities

According to the Association of Pedestrian and Bicycle Professionals, the lack of secure bicycle parking keeps many people from using their bikes for basic transportation. Many people are deterred from riding to work, school, shopping and other destinations, and instead drive, because of an experience with theft or the threat of theft. Providing a secure place to store bikes at cyclists' destinations is a key component of a robust regional bicycling network.

Many employers, jurisdictions and other public agencies have experimented with various bicycle parking designs for decades, including electronic lockers, bicycle stations, and various types of bicycle racks. This section provides an overview of these bicycle parking innovations and a brief discussion of the situations in which each is most appropriate.

Electronic Lockers

For bicyclists who need to leave their bicycles for long periods of time at transit stations or the workplace, security is a key concern. Long-term bicycle parking solutions have historically been limited to lockers, bicycle "lids," and other options that provide sheltered parking controlled with a key or padlock. The primary shortcoming of bicycle lockers is that just one user holds the key to each locker, leaving many lockers frequently empty but unavailable for rental to casual cyclists. Furthermore, while an agency may have the resources to purchase and install bicycle lockers, maintenance and administration are ongoing challenges. Lockers may be abandoned or vandalized, and frequently there are insufficient resources to maintain an accurate list of current users or respond to potential locker-renters in a timely manner.

One solution to the challenges posed by traditional bicycle lockers is the electronic locker, which is rented on an hourly basis on demand, rather than being reserved for months at a time by a single user. This allows each locker to be used by many people over a given period of time, increasing the number of bicycles stored in the lockers. Electronic lockers typically charge a small fee to discourage misuse, which is paid with a specially-designed debit card.

Bicycle Stations

Bicycle stations offer attended or automated long-term bicycle parking. Other services can also be available, such as bicycle repairs, sharing, rentals and retail sales. Bicycle stations can be operated by BikeStation (http://www.bikestation.org/), an organization that serves members and nonmembers by contracting with local partners to manage bicycle parking, service and retail facilities. Locations in Southern California include Long Beach, Covina, and Claremont. In addition, there are other, independently operated bicycle stations located at transit stations in various cities like San Francisco and Oakland, CA.

The annual operating cost of a bicycle station range from $25,000 for a small, unstaffed facility to $120,000-$150,000 for a fully staffed, full-service facility. Capital costs range from $25,000 for a secure room or cage to over $3 million for a more extensive facility. Bicycle stations have struggled to identify long-term revenue sources to cover their operating costs and are often

subsidized by outside funding, including membership fees, grants and operating funds from transit agencies.

6.5 Pedestrian Design Recommendations

Walkways are the portion of the public right-of-way that provide a separated area for people traveling on foot. Walkways that are safe, accessible, and aesthetically pleasing attract pedestrians. People walk for many reasons: to go to a neighbor's house, to run errands, to school, or to get to work or a business meeting. People also walk for recreation and health benefits or for the enjoyment of being outside. Some pedestrians must walk to transit or other destinations if they wish to travel independently. Outside of private developments, it is a public responsibility to provide a safe and convenient system for those who walk.

The Federal Department of Transportation provides guidelines for the safe design of pedestrian facilities through its work in the PEDSAFE program. The PEDSAFE or Pedestrian Safety Guide and Countermeasure Selection System presents various methods of pedestrian treatments available to jurisdictions. This comprehensive report can be found online at the Pedestrian and Bicycle Information Center website at http://www.walkinginfo.org/pedsafe/index.cfm, and need not be repeated here. Some highlights of other facility recommendations are described below.

6.5.1 Multi-Modal Mindset at the Design Stage

Integration of pedestrian design philosophy requires a comprehensive commitment by numerous agencies, organizations and interests. Such a mindset once established can, over time, create communities in which pedestrian activity is encouraged rather than merely accommodated.

- Designs of new and retrofitted developments should provide accommodation not only for automobiles, but bicycles and pedestrians as well. Subdivision ordinances should specify when sidewalks are appropriate based on traffic volumes and desired character of the community (e.g. rural vs. urban design).

- Mixed-use developments with integrated land uses should be encouraged, since they can foster more pedestrian-friendly environments and generate fewer vehicle trips.

- In areas that have already been urbanized, completion of local sidewalk systems will need to be determined based on local priorities.

- A "park once" policy, in which private or public parking facilities would be built to serve downtowns or activity centers could be instituted so as to reduce trips and the number of parking spaces required.

6.5.2 Traffic Calming

Traffic speeds and volumes through neighborhoods are often expressed as concerns by community members. A wide range of traffic calming treatments could be introduced to address

these concerns. These can be used in combination with pedestrian treatments such as crosswalks, signing, lighting to enhance safety.

A number of calming strategies could be considered, including:

- Street trees
- Speed humps and bumps
- Corner and mid-clock curb bulbouts
- Surface treatments
- Narrower streets
- Raised intersections/crosswalks
- Enforcement of existing speed limits

See FHWA's PEDSAFE program for available traffic calming options and application criteria.

6.5.3 Sidewalk Plans

Roadway design criteria, sidewalk planning and prioritization can be used in each jurisdiction to address pedestrian needs on arterial roadways, bridges and school routes. Sidewalk plans should address the following issues:

- Physical Condition: The condition of existing sidewalks may need to be improved. Tripping obstacles range from broken and hazardous sidewalk sections to overgrown shrubs and landscaping that block passage.

- Accessibility: Many intersections lack curb cuts and ramps for wheelchairs. Federal ADA requirements guide the need for improvement of these facilities. Jurisdictions can focus their efforts on access to transit stations, medical facilities, employment centers, and other areas most likely to need such access improvements.

- Connectivity: There are numerous missing sidewalk sections along older arterial roadways, often because the site fronting the roadway has not been developed. Local jurisdictions may be able to provide sidewalks on the frontage to close gaps and recover costs in a subsequent year when the site is developed. Closing sidewalk gaps can be prioritized around transit station locations. An inventory of pedestrian treatments and deficiencies, and plans to improve them, can be conducted through a partnership with local transit agencies.

- Signage that makes existing amenities more visible and accessible to pedestrians.

- Alleviation of congestion and channelization of pedestrian/vehicular flows at school sites.

- Safe routes to school inventories and plans.

- Access to recreational facilities

- Provision of paths on rural streets in accordance with the California Vehicle Code.

6.5.4 Education and Awareness Building

Awareness of the needs of pedestrians should be incorporated into school programs through the use of pedestrian safety courses. Additionally, education and pedestrian awareness issues should be incorporated into Department of Motor Vehicle driver's license tests. Across the country, schools and communities have developed "Walk Your Child to School Day" programs which incorporate local audits of the walking conditions faced not only by school children each day, but by all members of the community as well. These programs have proven effective in focusing community attention on issues ranging from local traffic enforcement, local street design and the quality of existing pedestrian facilities.

6.6 Bicycle Facility Maintenance

Most of the costs for bikeway maintenance are associated with off-road bike paths, as bike lanes and routes are typically maintained as part of routine roadway maintenance. However, as bicycle lanes require occasional restriping and other maintenance, a cost of $2,000 per mile annually is typical based on experience in other cities. This includes costs such as sweeping, replacing signs and markings, and street repair. Class I bike path maintenance costs are estimated at $8,500 per mile, which covers labor, supplies, and amortized equipment costs for weekly trash removal, monthly sweeping, and bi-annual resurfacing and repair patrols.

Maintenance access on Class I bike paths can be achieved using standard city pick-up trucks on the pathway itself. Sections with narrow widths or other clearance restrictions should be clearly marked. Class I bike path maintenance includes cleaning, resurfacing and restriping the asphalt path, repairs to crossings, cleaning drainage systems, trash removal, and landscaping. Underbrush and weed abatement should be performed once in the late spring and again in mid-summer. In addition, these same maintenance treatments should be performed on Class II and Class III facilities. These facilities should be prioritized to include an accelerated maintenance plan that is already a part of the City's ongoing street maintenance.

It is advisable to identify a reliable source of funding to cover all new Class I, II and III bike facility maintenance. All proposed designs should be closely examined to minimize future maintenance costs. In particular, maintenance on Class II and III facilities should be accelerated.

6.7 Security

Security may be an issue along portions of Class I bike paths. The following actions are recommended to address these concerns. Enforcement of applicable laws on bike paths is performed by local law enforcement agencies, using both bicycles and vehicles. Enforcement of vehicle statutes relating to bicycle operation are enforced on Class II and Class III bikeways as part of the these agencies' normal operations. No additional manpower or equipment is anticipated for Class II or III segments.

6.8 Liability

Liability is a major concern for all local governments. Liability for local agencies implementing and operating new bikeways and pedestrian facilities should be no different than the liability for new roads, parks, or schools. Local agencies should adhere to the following guidelines to minimize their liability.

6.8.1 Use of Design Standards

The designers, builders, and inspectors of a facility should adhere to widely accepted standards governing the design and construction of bicycle and pedestrian facilities. In addition to the Caltrans Design Manual, other applicable or useful reference standards include the Uniform Building Code; the AASHTO Guide for the Development of Bicycle Facilities, for Class I and II Bikeways; Florida Department of Transportation's Trail Intersection Design Guidelines, Island Press's "Greenways: A Guide to Planning, Design, and Development," Americans with Disabilities Act (ADA), and the Rail-to-Trails Conservancy's Trails for the 21st Century: A Planning, Design, and Management Manual for Multi-Use Trails.

Careful compliance with applicable laws, regulations, route selection criteria, and design standards should reduce the risk of injury to bicyclists using the bikeway, and also provide strong evidence that the agency used reasonable care.

6.8.2 Adhere to Maintenance Standards

Maintenance practice should be consistent along the entire facility, and conform to recognized maintenance practices. The responsible maintenance agency(ies) should have a written procedure to follow to maintain all portions of the facility, including the correction of pre-existing conditions such as drain grates.

6.8.3 Monitor Conditions

The responsible agency(ies) should have an internal mechanism to monitor and respond to actual operating conditions on the facility. This is typically done through the maintenance procedures, a record of field observations and public comments, and an annual accident analysis. Accidents should be reviewed to determine if physical conditions on the bikeway were a contributing cause. Agencies are advised against making any verbal or written comments that a facility is safe or safer than a non-designated route.

6.8.4 Keep Written Records and Correct Hazards

Written records of all maintenance activities and procedures, responses to reports of safety hazards, and other regular maintenance requests should be collected and regularly reviewed. While a facility may pass through numerous jurisdictions, it may make sense to have one contact person/department responsible for the entire facility, rather than risk confusion by incidents being reported to the wrong jurisdiction. Mileposts on the route may also help maintenance and enforcement personnel respond to problems. Trail managers should correct all hazards known by public officials in a timely fashion.

7.0 Plan Implementation

Chapter 1 stated that San Bernardino County can and should be one of the centers of cycling and pedestrian activity in Southern California. Subsequent chapters identified the assets and opportunites within San Bernardino County suggesting that this is possible. In addition, a robust non-motorized transportation system can be an implementation element of the overall "vision" for San Bernardino County to be a great place to live, work, and play. However, this cannot occur without a well-focused and aggressive implementation strategy.

This section identifies an implementation strategy for the NMTP and a description of funding opportunities for the proposed bicycle and pedestrian improvements. The implementation strategy consists of the following elements:

- Identification of implementation priorities (both infrastructure and institutional)
- Coordination of responsibilities for project delivery
- Identification and pursuit of funding opportunities

Each of these elements is described below.

7.1 Implementation Priorities

The setting of priorities for the NMTP involves more than just the identification of priority projects, although it does include that. Priorities must also consider institutional initiatives that pave the way for the delivery of priority projects. Thus, the priorities for the NMTP include the recommendations for system improvement identified in Chapter 3, plus several institutional initiatives to foster program and project delivery. The following represent NMTP priorities (not in order of importance):

1. Deliver the Class I backbone bicycle system. Although the Class I facilities can be considered a backbone bicycle system, there is much more to the network than just Class I facilities. Other types of facilities can also be delivered more quickly and less expensively, improving regional connectivity.

2. Develop better bicycle connectivity between cities and subareas of the County. This must include improved collaboration with Caltrans, given the number of State highways connecting the subareas.

3. Increase connectivity on Class II and Class III bicycle facilities by prioritizing the "low-hanging fruit" – parts of the regional system that are low-cost, close gaps in the system, and provide connections to key destinations.

4. Develop a better "sense of a system" through improved signage, markings, and way-finding for both cyclists and pedestrians.

5. Proactively coordinate integration of cycling and walking accommodations with the State's Complete Streets requirements.

6. Proactively coordinate integration of cycling and walking access accommodations to and from transit stations.

7. Aggressively pursue grant funding and devote additional programmatic funding to non-motorized facilities.

8. Identify individuals within SANBAG, local jurisdictions, Caltrans, and transit agencies to be points of contact on non-motorized facility implementation and ensure communication on non-motorized topics among the agencies.

The full identification of Class I bicycle facilities is contained in the subarea maps in Chapter 3 and in the individual jurisdiction plans in Chapter 5. Several key Class I projects listed in the 2001 NMTP and the 2006 update that would be considered as part of the Class I backbone system include:

- Santa Ana River Trail
- Pacific Electric Trail
- Orange Blossom Trail
- San Timoteo Canyon Trail
- Riverwalk Trail
- Cajon Pass Connector – Route 66 Heritage Trail

Descriptions of the Santa Ana River Trail and Pacific Electric Trail may be found in Chapter 3. Information on the other planned facilities may be found in the individual jurisdiction sections.

7.2 Coordination of Responsibilities for Project Delivery

The policies listed in Chapter 2 provide guidance as to how implementation is to occur. Local jurisdictions are responsible for the identification, prioritization, and implementation of non-motorized transportation projects within their jurisdiction, with SANBAG serving in an advisory capacity and coordinating activity where necessary. SANBAG is also to work with local jurisdictions to develop a regional way-finding system.

The policies also identify a role for SANBAG to pursue grant opportunities for State/federal bicycle and pedestrian infrastructure or planning. SANBAG will support local jurisdiction grant applications or collaborate with local jurisdictions to directly submit grant applications for projects in the Plan. The pursuit of grant application opportunities is one of the areas identified in the Plan where substantial improvement is possible, as San Bernardino County has been under-represented in the share of non-motorized grant funds that have been awarded in the past.

This Plan recognizes that regional cooperation among local agencies is critical in the selection and promotion of priority projects and the allocation of local funding to ensure an orderly implementation of an effective bicycle system.
The schedule for implementation on a year-to-year basis can be better coordinated and should be determined by:

- Relationship to the regional system;
- Readiness of each project in terms of local support;

- CEQA approvals;
- Right-of-way requirements;
- Timing with other related improvements; and/or
- Success in obtaining competitive funding.

SANBAG staff should monitor the short- and mid-term projects identified in this Plan and subsequent updates, and maintain a comprehensive list of projects and funding allocations. A rolling five-year schedule of short-term projects should be identified so that resources can be focused and coordinated to ensure attention to priority projects over time. This is not to the exclusion of other local projects, but regional connectivity to support commuting and other longer-distance trips is an emphasis of this Plan. Each year the TTAC and SANBAG staff will review the list of projects slated for priority that year, review the readiness of each project to be proposed for funding, and consider the sequencing of the projects.This process does not preclude cities and local agencies from continuing to submit other local projects for funding consideration.

7.3 Funding Opportunities

There are a variety of potential funding sources - including local, state, regional, and federal programs - that can be used to construct the proposed bicycle and pedestrian improvements. Most of the federal, state, and regional programs are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. In addition, the majority of the programs require a local match, usually 10-15% of the total project cost.

The recipients of grant funds for many of these programs are then required to monitor the projects for compliance with the program guidelines. Although the pursuit and administration of grant moneys can require a significant amount of staff time, grant funding allows for the construction of more miles of facilities.

The key to receiving funds will be to tailor grant requests to meet specific requirements and criteria, leverage grants with matching funds, and demonstrate a commitment by the jurisdiction to implement and maintain the system. Serious intent would include adoption of the NMTP, development of an additional local plan, inclusion of bikeway improvements into the Capital Improvements Plan, adoption of recognized design and operating standards, and public/political support.

A detailed breakdown of available funding programs is provided on the following pages. Tracking program specifics can be difficult as program guidelines are modified regularly. Thus it is important to verify program dates and deadlines with the program administrator since specific amounts and deadlines can change from year to year.

7.3.1 Federal Funding

Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and Subsequent Federal Authorizations

SAFETEA-LU sets the framework for spending federal transportation revenue. SAFETEA-LU expires with the federal fiscal year in 2009, and Congress will adopt successor legislation with new funding programs and guidelines. Many of the programs described in this section may remain.

Federal funding through SAFETEA-LU will likely provide some of outside funding for the NMTP projects. SAFETEA-LU currently contains three major programs that fund bikeway and/or trail projects; Surface Transportation Program (STP), Transportation Enhancement Activities (TEA), and Congestion Mitigation and Air Quality Improvement (CMAQ) along with other programs such as the National Recreational Trails Fund, Section 402 (Safety) funds, Scenic Byways funds, and Federal Lands Highway funds.

SAFETEA-LU funding is administered through the California Department of Transportation (Caltrans) and SANBAG. An annual Call-for-Projects competitive allocation process can be used to determine project funding. A local match is often required for receipt of funds.

Safe Routes to School (SRTS)

As of 2006, a new federal Safe Routes to School program offers grants to local agencies and others for facilities and programs. Bikeways, sidewalks, intersection improvements, traffic calming and other projects that enhance bicycle and pedestrian safety to elementary and middle schools are eligible. Safety education, enforcement and promotional programs are also eligible.

Caltrans administers this grant funding and releases the funds in multi-year cycles. Approximately $46 million was spent statewide in 2008 SRTS-funded projects. The funds are distributed to each Caltrans district according to school enrollment. District 8 (Riverside and San Bernardino Counties) received approximately $6.5 million. Local jurisdictions, school districts and other agencies compete for these funds. This program will have to be reauthorized with the federal transportation bill.

7.3.2 State Funding

Local Transportation Fund TDA Article III (SB 821)

Transportation Development Act (TDA) Article III funds are state block grants awarded annually to local jurisdictions for bicycle and pedestrian projects in California with about $700,000 awarded for San Bernardino County. These funds originate from the state gasoline tax and are distributed to counties based on population, with a competitive process administered by SANBAG for local jurisdictions.

Clean Air Funds

AB 434 funds are available for clean air transportation projects, including bicycle and pedestrian projects, in California. Please check your local Air Pollution Control District (Southern California Air Quality Management District or the Mojave Desert Air Quality Management District) for attainment and funding status.

State Bicycle Transportation Account

The State Bicycle Transportation Account (BTA) is an annual statewide discretionary program that is available through the Caltrans Bicycle Facilities Unit for funding bicycle projects. Available as grants to local jurisdictions, the emphasis is on projects that benefit bicycling for commuting purposes. The state legislature has historically authorized about $7.2 million per year.

http://www.dot.ca.gov/hq/LocalPrograms/

Safe Routes to School (AB 1475)

The Safe Routes to School (SR2S) program uses allocated funds from the Hazard Elimination Safety (HES) program of SAFETEA-LU. This program, initiated in 2000, is meant to improve school commute routes by improving safety to bicycle and pedestrian travel through bikeways, sidewalks, intersection improvements, traffic calming and ongoing programs. This program funds improvements for elementary, middle and high schools. A local match of 10 percent is required for this competitive program, which allocates over $20-million annually or $40 million to $45 million in two-year cycles. Each year the state legislature decides whether to allocate funds to the program or not.

http://www.dot.ca.gov/hq/LocalPrograms/saferoute.htm

Office of Traffic Safety (OTS)

The Office of Traffic Safety (OTS) seeks to reduce motor vehicle fatalities and injuries through a national highway safety program. Priority areas include police traffic services, alcohol and other drugs, occupant protection, pedestrian and bicycle safety, emergency medical services, traffic records, roadway safety and community-based organizations. The OTS provides grants for one to two years. The California Vehicle Code (Sections 2908 and 2909) authorizes the apportionment of federal highway safety funds to the OTS program. Bicycle safety programs are eligible programs for OTS start-up funds.City agencies are eligible to apply.

Environmental Enhancement and Mitigation Program (EEMP)

EEM Program funds are allocated to projects that offset environmental impacts of modified or new public transportation facilities including streets, mass transit guideways, park-n-ride facilities, transit stations, tree planting to mitigate the effects of vehicular emissions, off-road trails, and the acquisition or development of roadside recreational facilities. The State Resources Agency administers the funds.

AB 2766

AB 2766 Clean Air Funds are generated by a surcharge on automobile registration. The South Coast Air Quality Management District (AQMD) allocates 40 percent of these funds to cities according to their proportion of the South Coast's population for projects that improve air quality. The projects are up to the discretion of the city and may be used for bicycle projects that could

encourage people to bicycle in lieu of driving. The other 60 percent is allocated through a competitive grant program that has specific guidelines for projects that improve air quality. The guidelines vary and funds are often eligible for a variety of bicycle projects.

7.3.3 Local Funding

New Construction

Future road widening and construction projects are one means of providing bike lanes and pedestrian infrastructure. To ensure that roadway construction projects provide bike lanes where needed, appropriate and feasible, it is important that an effective review process is in place so that new roads meet the standards and guidelines presented in this master plan. In San Bernardino County, new or widened arterials, and the bicycle facilities that accompany them, may be funded through a combination of Measure I half-cent sales tax funds, development fees, and other local funds.

Environmental Review

Impacts to bicycle and pedestrian circulation and safety should be analyzed in all CEQA documents in the County with appropriate mitigations identified as needed. This mechanism represents a significant opportunity to ensure that non-motorized improvements are included as a component of new transportation projects.

Mello-Roos Community Facilities Act

Bike paths, lanes, and pedestrian facilities can be funded as part of a local assessment or benefit district. Defining the boundaries of the benefit district may be difficult unless the facility is part of a larger parks and recreation or public infrastructure program with broad community benefits and support.

Other Local Revenue Sources

Local sales taxes, fees, and permits may be implemented, subject to local approval. Volunteer programs may substantially reduce the cost of implementing some of the proposed pathways. Use of groups such as the California Conservation Corp (who offers low cost assistance) will be effective at reducing project costs. Local schools or community groups may use the bikeway or pedestrian project as a project for the year, possibly working with a local designer or engineer. Work parties may be formed to help clear the right of way where needed. A local construction company may donate or discount services. A challenge grant program with local businesses may be a good source of local funding, where corporations ‘adopt’ a bikeway and help construct and maintain the facility.

Other opportunities for implementation will appear over time that may be used to implement the system.